CAPE OF GOOD HOPE.

REPORTS

ON

VITICULTURE

IN

THE CAPE COLONY,

BY

BARON CARL VON BABO.

Presented to both Houses of Parliament by command of His Excellency the Governor.

1885.

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I. REPORT ON THE VITICULTURE OF THE COLONY.

Extent of the Viticulture.—Only the climate of the Western Province is favourable to the cultivation of the vine, in as much as the rainy season during winter supplies the vine with sufficient moisture, whilst the almost uniformly high temperature of the summer months every year secures a crod of really ripe grapes, which contain a large amount of sugar and fine bouquet-compounds. With regard to the soil of the wine-producing districts of the Colony there are two distinct types. The districts to the west of the Drakenstein mountains have *granite* as their basis; to the east of this range the vineyard soil is alluvial and characterized by a considerable amount of lime, which often occurs as a solid stratum a few inches under the surface of the soil throughout the districts of Worcester, Robertson, Montagu, Ladysmith, Calitzdorp, and Oudtshoorn. The alluvial soil is often a depth of from 10 to 20 feet.

The largest areas of soil planted with vines are, in the Eastern districts, on the granitic soil. However, the quantity of wine obtained from every 1,000 vines in these districts is much less than in the lime-soil districts. In these lime-soil districts there are still enormous areas of land available for viticulture, which can be planted with vines as soon as wine fit for export is produced in the Colony. There is land enough on which to grow as much wine as will supply any demand from foreign countries.

In the interior the amount of rain per year is much less than in the coast districts, and the moisture derived from the summer and winter rains is insufficient to keep the vine in vegetation. Irrigation is therefore necessary in the vineyards, and, as a rule, the vineyards are irrigated three or four times a year, and in some very dry localities even six times.

The Site.—Hills are the best sites for vineyards. The sites to the north and east are preferable. The cultivation of the hills can only be carried on in the coast districts. The further extent of viticulture in the lime-soil districts depends upon the making of dams; the cost of making dams is very small in comparison with the great advantages derived from them. There is still much good soil in the lime districts suitable for vineyards, but without water. Some of the vineyards in the coast districts require drainage. Wherever this is the case proper drains have been constructed.

The Planting of Vineyards.—The preparation of the ground for planting a vineyard is correctly done by delving the soil; the vines are planted in rows, equidistant from each other, but without regard to the direction of the rows. As soon as a better method of growing the rows has been adopted the rows ought to be from south to north, so that the sun's rays during the middle of the day may fall chiefly on the ground. The heat thus absorbed during the day is radiated during the night, and promotes a better development of the grape during the last stages of ripening. As a rule the vines

are planted four feet square, formerly only three feet square. In some new plantations at the Paarl and elsewhere the vines are planted five feet, in order to give the sticks more soil, light, and air. This should be carried on more generally on the alluvial soils; but it appears that throughout the vine districts too little attention is given to the specific requirements of the different kinds of grapes; they are all treated more or less alike. The wine farmer should never forget that the same kind of grape requires a different treatment on different soils, and we can hardly find a greater difference in soils than we have at the Cape between the poor granitic soil and the rich alluvial soil.

The working of the ground is, on the whole, sufficient and satisfactory. It is very good in the districts in which wine is chiefly made, and better than in the brandy-producing districts. The digging of the vineyards in spring is much to be recommended, but in summer not more than is required for removing the grass. This cannot be done too much, and should be done before the seed of the weeds ripens. Some wine farmers use the cultivator; this instrument may be used with advantage in young vineyards; the manner in which the vines are planted interferes somewhat with the use of this very suitable instrument. It will, however, never replace the hand work, but this is only required where choice vines are grown.

The vines are planted as a rule as cuttings of 18 inches to 2 feet long, and remain without further treatment. Root cuttings are not used, and not required if a proper selection of cuttings be made. This, however, is generally not done. There are ever so many sticks to be found in new plantations which are dried up along with others which exhibit a most beautiful growth. The drying up of the cuttings appears frequently to be due to the mode of planting the cuttings, the upper portion standing out of the ground and promoting the evaporation of moisture from the stick. Properly selected and properly planted sticks grow splendidly during the first year, develope a healthy root system, and thus establish the conditions for a strong and luxuriant growth in the following seasons.

The Growth of the Vine.—This is extremely simple and called in Europe "Kahlschnitt," the cutting sends up two shoots, which are cut down in the second year to two eyes, which again furnish the four shoots, the basis of the vine. In course of time these get longer and form the "old" wood, which sends forth the bearers. This method of growing the vine is not to be recommended and is not improved by the cutting back of the shoots during the summer months. It is only due to the wonderfully favourable conditions of climate and soil, that in some vineyards vines are found a hundred years old and still bearing, having all the time been under this cruel treatment. Although it may be of some use in the coast districts to keep the vines short on account of the high winds, it is certainly unsuitable in the other districts and not applicable to all kinds of vines. As far as I have been able to ascertain no experiments have been made for the purpose of determining the most suitable methods of cutting and growing the principal kinds of vine grown at the Cape. This is one of the first subjects which requires the attention of the wine farmers. But it cannot be done in one year as it requires a number of years of careful observation, and is best done on an experimental or model wine farm. For example, it is quite certain that the Pontac should be grown on a trellis or on poles, because it bears well even when it is not cut back to two eyes. Any other treatment of the Pontac than the present can only produce splendid results. There is little doubt that some other kinds of vines cultivated at the Cape should also be grown on trellises. The expenses of these vine trellises are not considerable, because if properly made they last a number of years and even then only require little repair.

Manure.—The importance of a suitable manure is entirely disregarded throughout the wine districts. Only at High Constantia is this important question properly attended to, and the splendid results derived from a correct

system of manuring, on this estate, prove that notwithstanding the fertile soil of the Colony, the mode of manuring is very important. However rich a soil may be in all the inorganic constituents, which the vine annually requires, there will at last be a time, when the amount of the one or other of the absolutely necessary mineral constituents will be exhausted. In Viticulture there is no rotation of crops of which the chief object is to avoid the exhaustion of the soil with regard to some particular constituents, by cultivating, in succession, on the same land such plants as require unlike quantities of certain constituents. On the same soil the same vines grow for a long period of years, and if we sum up the amount of the annual constituents which are annually taken off by a certain number of vines, it will readily be understood that only by the selection and application of suitable manures an exhaustion of soils can be avoided. The condition of the vineyards in some of the richest alluvial soils proves this.

The vineyard manure should principally consist of all cuttings, leaves, &c., from the vineyard; cattle manure and compost; but whatever is taken into the vineyard as manure should be completely rotten and decomposed. Fresh manure, especially of sheep and horses, does more harm than good to the growth of the vine and to the quality of the wine. Mineral manures are of special importance for vineyards. As the granitic soils of the Cape are very poor in lime, this substance is of great value as a manure, because vines require a very considerable amount of lime. Wherever it has been used it has given satisfactory results, and its application is much to be recommended.

The different kinds of Grapes in the Colony.—It is most fortunate that the different kinds of grapes grown in the Colony, produce a very excellent wine. This is of great value, because the introduction of new kinds would endanger the whole viticulture of the Colony by carrying the Phylloxera to South Africa. The law prohibiting the introduction of vines, &c., &c., has removed all danger, and it was made just in time to keep this plague from the Colony. The Phylloxera *was not in the Colony* when the law came into force, because its presence in the Colony would have shown itself by this time. The most rigorous enforcement of this law is the surest protection of the Cape Viticulture. But in order to be prepared for any emergency, it is necessary for this Colony to follow the example of France, Germany and Austria. The Cape vines must be grafted on American vines as basis. These are to be raised in a nursery vineyard connected with the experimental wine farm. They are obtained by importing the seeds of the best kinds of American vines. The seedlings of these are cultivated for obtaining cuttings on which our vines are grafted. The climate of the Cape is very favourable to the improvement of the vineyards by this method. The very different properties of the several kinds of grapes render it probable that vines of different characters can be produced. But only a proper method of mashing, pressing, and of manipulation of the wine in the store will show what sort of wine each variety of grape will produce.

The most common grape is the *Green grape.* This is however not due to the superiority of this grape over the others, but principally to the fact that this grape withstands the action of insects and of fungus better than others, and that it has a more vigorous growth. It will certainly produce a good wine for export.

The *Hanepot* is distinguished by a strong bouquet which might make the hanepot wine very superior; the wine is, however, very delicate with regard to soil, oidium, and rust. Until a better manipulation of wine has been generally adopted it will be advisable to use the hanepot only for making raisins. The present way of making raisins is unsatisfactory, the dipping into ash lye before drying imparts a harsh by-taste to the raisins, which renders them unfit for the European market. Large quantities of raisins are then made into wine, and good raisins will find a ready market. The Hanepot can also be

used with advantage for export, as it is more fleshy than other grapes. At present this grape is sent as far as Kimberley and the Transvaal during the hot summer months, and stands a journey of ten days; therefore if properly packed, and if kept in a cool place it must stand the long voyage to Europe.

The Stein Grape.—This grape is not common, but is distinguished under favourable conditions by a large yield. The Stein wine is a most delicate wine.

Red Muscadel.—This grape ripens early and produces good wine. The wine when old is a superior invalid wine.

White Muscadel.—The white muscadel possesses a strong muscat taste. It is not much grown, but will most likely be suitable for making sweet wines.

Of the dark Grapes the *Pontac* is the most valuable. With careful manipulation it will give a very fine dark wine, which equals the Bordeaux, and which will always find a market in Europe. It is comparatively too little grown, and if properly manipulated will not cover the demand in the Colony. Besides the above-mentioned varieties there are some others grown in the Colony, but it is at present impossible to say anything definite as to the quality of the wine which would be made from these grapes. In many vineyards two or more kinds of grapes are planted all mixed up, and on the whole sufficient attention is not paid to planting the vineyards uniformly with one kind of grape. As the different kinds of grapes ripen at different times a great deal of inconvenience is experienced at the time of harvest, because the men have to go through the vineyard twice. If the grapes of different varieties are all plucked at the same time and thrown together, an inferior wine is produced.

Climatic and other influences detrimental to Vines.—It is very rare that unfavourable weather causes harm to the vine. Some cases have come to my knowledge in which hailstorms in spring have destroyed the crop. In one particular case the growth of the vine was so vigorous that next to the first shoot partly or completely destroyed by hail a second shoot appeared which ultimately produced a good average crop.

Cold also does not affect the vineyards much; but I cannot speak from experience on this point, as I only arrived here after the cold season of 1884 had passed.

Of insects it is chiefly the Calander beetle which does most harm. It is often met with in very large numbers, and causes considerable damage to many vineyards. It is generally caught and destroyed in the following way: A few green leaves are placed together at the stick. Towards evening when it is getting cool the beetle hides itself in the loose leaves, which are then collected and burnt.

In some young plantations in the Worcester and Paarl districts another beetle does much harm by eating off the bark of the newly planted cuttings, and thus destroying them. As the insect lives in the ground it is only found with difficulty. On some farms the beetle is kept from the young vines by beans, planted between the grapes, which are more to the liking of the animal.

Many vineyards suffer from Oidium; moist situations are affected most; the vineyards near the coast also suffer much. Some varieties of grape, such as the Hanepot and Stein grape, are affected more easily than others. The best remedy is sulphur, the finer the more effective it is, and the less is required. It must be frequently used, specially during wet weather, as the fungus develops most rapidly in moist air. It is frequently insufficient to sulphur only once or twice in a season; moist and low situations require a weekly sulphuring. If the vineyards in a district are sufficiently sulphured by all the wine farmers the damage done by the oidium can be reduced to a minimum. But if only one or two farmers in a district sulphur it is of very limited use, as the germs are constantly carried over by the wind from

the neighbouring vineyards. Grapes badly or insufficiently sulphured are quite covered with fungus and remain undeveloped. Wine prepared from such grapes is of inferior quality and does not keep.

The best way of sulphuring is by means of the bellows, not by bags. When bags are used for sulphuring the sulphur is never uniformly distributed, and much more sulphur is used than with the bellows.

The "pocks" is also a disease due to fungus, which appears to affect the hanepot more than the other kinds of grape. The hanepot is so much affected that the quantity of grapes is considerably reduced, and its quality is also rendered inferior. There are no generally recognized remedies against this fungus; the most efficient way of checking the progress of this disease is to remove in time all shoots, &c., on which it appears.

Calculations and Estimates of the yield of Vineyards.—I have not been successful in getting accounts, data and statistics as to the yield of the vineyards, from which some calculation could be made as to the profit derived from viticultural pursuits in the Colony. The farmers approximately know the extent of their property, but are in perfect ignorance regarding the exact area which is devoted to viticulture. The standard of measure is not the acre or morgen, but the number of 1,000 sticks. The value of the area planted with vines ought to be fixed, in order to be able to find the interest of this capital, and to compare it with the value of the produce. No complicated system of book-keeping is wanted for obtaining this absolutely necessary information. The statements as to the yield of 1,000 vines vary very much. In the Coast Districts it amounts from 1 to 2 leaguers, in the Interior from 3 to 6 leaguers. But these statements are very inaccurate, because the yield is frequently given in brandy, and in some places it amounts to 1 leaguer of brandy per 1,000 sticks. But the farmer seldom knows exactly how many leaguers of wine he requires for 1 leaguer of brandy. It may be as much as 6 to 7 leaguers of wine for 1 of brandy. As it is very rare that the whole crop is lost, the average yield of the vineyard is very high. In European vineyards the yield of 1,000 sticks is never 1 leaguer, although in the southern parts of Europe, vineyards are met with in which there is a higher average yield. But bad years are so frequent that the average yield of vineyards in Europe is about one-sixth of the yield of the vineyards at the Cape.

As soon as the Cape wines are properly prepared and manipulated, they will be the best material for mixing and improving the light and inferior European wines. These two facts, viz., that the yield of the vineyards at the Cape is greater than anywhere else in the world, and that the Cape wine, when well prepared, is a superior article, secure the future of the Viticulture of the Cape, although it may be several thousands of miles from the principal markets of the world. If the juice of the Cape grape is properly treated and prepared for the European taste, it will always find a market in Europe.

The making of the Wine.—In the sun of South Africa the grapes ripen to perfection, and the South African grapes are an excellent material of which to make wine, which will find ready customers. But in consequence of great negligence and bad or insufficient manipulation, a wine is produced which does not deserve the name of "wine." This is borne out by the ill success of the numerous attempts made with a view to exporting Cape wine to Europe in large quantities. The fact that small samples of better wine arrived in a sound condition in Europe does not disprove the fact that the bulk of the Cape wine would not stand the journey to Europe. I have frequently heard the opinion expressed, that no wine made at the Cape could stand the voyage to Europe. This is entirely erroneous and false; all wine merchants in Europe know perfectly well in what condition a wine must be, in order to stand a sea voyage, during which it is exposed to very high and very low temperatures. If common Cape wine (*i.e.*, wine with fusel or spirits taste) is taken to Europe, it is obvious that such an article cannot find friends amongst

a public which is accustomed to the exquisite wines of Europe. They do not like the Cape taste; but I still doubt whether the taste of the public at the Cape is such, as to object to wines which have been properly prepared. I hold that properly manipulated Cape wines will find a market in the Cape Colony as well as in other parts of South Africa.

The making of brandy is still more unsatisfactory than the making of wine. By the use of bad stills and unreasonable working, the otherwise excellent material is made into a product, which is altogether objectionable. A very good brandy could easily be made and would find its market. It is much to be regretted that no good brandy is made, because this would be the best way of disposing of the surplus of wine which is now in the Colony. I must repeat that the material (the ripe grapes) in the Colony for making wine and brandy is very excellent and very superior; but the knowledge for making a valuable and marketable article is wanting.

It is unjustifiable to give the Cape wine a name to which it has no claim. Why are certain Cape wines called Sherry, from a locality in Spain? Are they, perhaps, afraid to appear in public without a mask? Who is to be imposed upon? The consumers at the Cape know all about the origin of this sort of Sherry, and there are no foreign consumers. Besides, the new label does not improve those wines of which the flavour would penetrate through the most beautiful label with a famous name. It is entirely useless and misleading to adopt foreign names for Cape wines; such names as Constantia, Paarl, Breede River, and Montagu on the labels of bottles containing properly prepared and manipulated Cape wine will read as well as Sherry and Madeira. A really good article does not require a high-sounding name, it will recommend itself by its properties. Also the name Hock is false and unjustifiable; it means Rhine wine; but the character of the wine which goes under this name is just the opposite of the wine which is called Hock at the Cape. Good Cape wine under its true name will soon become known and famous.

Character of the wines of the merchants.—These wines, with a very few exceptions, have in common a disagreeable and strong brandy taste. Such wines have been mixed with so much brandy that they cease to be wines; they are liqueurs. Notwithstanding the large amount of alcohol which they contain, they are not clear and always somewhat "dusty." In consequence of the addition of other substances they acquire a by taste which does not improve them. And they are not free from diseases; many are distinguished by a pronounced acetous taste. The colour is often made darker by means of burnt sugar, to let it appear older; but the immature character of the wine is not done away with by these experiments. No attention is paid at all to the difference between table wines and sweet wines. A considerable fraction of the wine drinking community wants sweet tasting wine, and this compels the merchant to make dry wines sweet, and this is generally done by sugar, or by the addition of extract wines. It is obvious that wines of this nature cannot find favour with all wine drinkers, and the consumers are compelled to turn to beer or brandy, which are imported in large quantities. And how readily could good wine compete with these articles! These wines, of course, cannot ever be expected to be fit for export. Also some very old wines are met with here and there, and they are very good, but in quantity too insignificant for purposes of export. It was the old wines which in former times established the reputation of the Cape wines. Something very superior was then meant by the words "Cape wine," and it is to be hoped that this old reputation will be re-established, to the benefit of the active, ambitious, and unprejudiced wine farmers and wine merchants at the Cape.

As I have stated already, it is the manipulation of the wine which is to be blamed for the quality of the Cape wine. The cutting of the grapes, the separating of the ripe from the unripe grapes, the collecting of the grapes before pressing, is all done, with a few exceptions, in a careless manner. But the climax of the untidy proceedings is reached in the tramping of the

grapes. During this operation the germs of the acetous fermentation are carried on the feet from the floor into the fermenting liquid. There is in almost all cellars wine spilt on the floor, in which the acetous germs develop and exist; they fill the air of the stores and get also in this way into the wine. In those districts where the grapes ripen late, the chances for the development of acetous germs are less favourable, and more sound wine is found there than where the pressing is in the hottest time of February. The liquid obtained by means of tramping from the grapes is brought into the fermenting vats. The mistakes made in this operation are the following:— The fermenting tubs are open; the air has free access, and with the air the enormous quantity of acetous germs which are in the wine store, and they can freely and beautifully increase and develop. The free access of warm, almost hot, air also allows a luxuriant development of the germs of the alcoholic fermentation; the fermentation is therefore much too powerful, the fermenting wine gets too hot, so that the germs of the alcoholic fermentation are interfered with in their action on the sugar, and a portion of the sugar remains unfermented, and thus the fermentation is unfinished and the wine sweet, and is difficult to manipulate, on account of the still unfermented portion of the sugar, which may any time commence to ferment again. The rapid fermentation in open vats also affects the taste and the bouquet compounds. By fermenting the must on the husks the raw tannin-containing compounds are extracted from the husks; husks and stalks should therefore be separated from the must of the light wines. The juice of the dark wines must ferment on the husks. The fermentation of the juice of dark grapes should only be carried on in closed tubs. The fermentation of the juice of the white grapes must be done in casks provided with fermentation bungs.

The more or less fermented must is transported into casks. The casks, as well as the stores in which they are, are often deficient; most stores are not well kept. A wine store in this hot climate, which is not kept scrupulously clean, cannot produce a sound wine. Cleanliness, and only cleanliness, is the first condition in the manipulation of wine. The wine store should not serve as a receptacle of all sorts of things; it should be a wine store only.

The old wine stores, which may still be found on many farms, were better constructed. They were in the shade of trees, covered with thick thatch, with solid substantial walls, and cool in summer. In these stores was made, with the application of more care, a better wine, and even now these stores distinguish themselves by the better quality of wine which they contain. The wine could at least properly mature in such stores, and could gain the reputation which formerly the Cape wines had. The modern stores are light structures. They must be as cheap as possible; the roof is made of iron, the walls are thin, and the whole flimsy framework is exposed to the rays of a burning sun. The temperature is in summer excessively high, and in winter very low. The wine now, insufficiently prepared and kept in such stores, cannot be good.

But in order to keep the wine all sorts of means are employed. One of these is to sulphur the wine. The sulphuring prevents, of course, the complete turning of the wine, but keeps it sweet, and thus prevents any maturing or getting to perfection of the wine. Another means for keeping the wine is brandy. It is added in such exorbitant quantities as to prevent any further development of fermentation; the character of the wine is, of course, by this completely altered. If sound wine is kept in clean casks in a good store, there is no need for brandy. The addition of alcohol can only be recommended for making sweet wine. Many wine farmers want to fine the wine the first year. Blood and lime are used for this purpose, but the use of both must be strongly condemned. The whole secret of making wine is to press the juice in the cleanest possible way; to ferment the juice in closed

casks, or in peculiarly constructed fermenting vats (for red wine); to keep it in clean casks in a clean store; and to draw it over *four* times during the first year; after this it is ready to undergo the more refined manipulation.

BARON CARL VON BABO.

II. REPORT ON THE VINTAGE OF 1885.

The prospects of a good crop were very favourable up to the flowering season. So far the development of the vines was normal and the bearers were full. During the flowering season the vine requires warm and dry weather. But this time the weather was very unfavourable, wet and cold days having been frequent at that time. In consequence the flowering season extended over a longer time; the grapes, even on the same stick, did not come to perfection at the same time. Another effect of the wet weather during the flowering season was that the fructification was not complete on the stalks, and therefore many branches had only a few loose berries instead of being compact bunches. I observed this particularly on the Haanepot in the Worcester district. Notwithstanding this drawback the prospects still remained good till January, when the excessive heat did much harm, particularly in those districts where the grapes ripen first. As it was at the same time also very dry, the regular development of the grapes was checked, the berries remaining smaller than usual, and this was an additional cause for the diminution of the returns of the vineyards. The excessive heat also did much damage by drying up the berries, and this was chiefly the case in those situations which have a dry subsoil. Besides those unfavourable climatic conditions, the *oidium* also has done much harm; the wet weather in spring promoted its spreading very much. This spreading of the oidium clearly proves that many wine farmers are not careful enough in using sulphur; they have been severely punished for their want of attention by the damage done by oidium. The best effect of sulphuring is obtained when it is done during the flowering season, because the young undeveloped berry is most liable to attacks of oidium. When the berry gets stronger its epidermis is harder, and is a less suitable basis for the oidium. The Cape climate is certainly very favourable to wine growing, but the oidium also develops splendidly, and therefore general efforts must be made by all wine farmers to meet this plague. Frequent sulphuring at the proper times has always been successful. The wine farmer must not think he has done his duty by having sulphured twice or three times; continuous attention and watchfulness are required. A few farmers who have been persevering in sulphuring their vineyards have been most successful. It is true the limited supply of sulphur in the Colony raises the price, and not all farmers could have got sufficient sulphur this year. The effect of sulphuring does not solely depend upon the frequent application of the same, but also upon its quality. Only pure sulphur must be used. The sulphur must also be very fine. Very fine sulphur does not fall down so quickly on the ground; it adheres better, and can be more uniformly spread throughout the whole foliage of the stick. The finer the sulphur the larger is the volume of the same weight, and the less is used.

The rain shortly before the ripening of the grapes also caused much damage, as many grapes were rotting. Lower situations lost more by this than situations on hills and slopes. It appeared that Haanepot and Hermitage were less affected by the wet weather than other varieties. The bunches which were lying on the ground were almost completely destroyed. No doubt a better training and growth of the stick would do much to prevent a great loss by rotting in consequence of wet weather. The gathering of the grapes under these circumstances should have commenced earlier; the inferior quality of the wine would not cause so much pecuniary loss as would the great diminution of quantity. In the coast districts the total reduction of the

crops, caused by all the unfavourable effects of climate, &c., was about 40 per cent. of the average production; in the Worcester district only 10 per cent. Having suffered from all these disadvantages the intelligent farmer will, of course, inquire whether it is possible to meet or to avoid the effects of these visitations. What means must be employed in each case? I am not aware that such or similar questions have been much discussed, because the climate is generally so excellent as to give no cause of complaint. But the discussion of these questions will be of much use in good years as well as in bad years. These questions refer more particularly to the different methods of growing and training the vine, and to the most suitable kinds of vines for certain soils and situations. The wine farmers at the Cape have still to learn much and to learn it by experience with regard to these important matters, as the immediate effect of better knowledge and application of the same, will be a better quality and a larger quantity of wine.

The splendid crops of wine at the Cape are certainly due only to the good soil and excellent climate, and not to the primitive way of growing vines. The application of more skill and knowledge of the nature of the vine would much lessen the loss as has been suffered this year. Many farmers are in the habit of sending their cattle into the vineyards after the grapes have been cut; this is a most objectionable practice, and it injures the vines very much.

The following table shows the amount of sugar in the juice in different localities; it is, in consequence of the less favourable weather, not as high as last year:—

			SPECIFIC WEIGHT.	SUGAR °/o.
		Paarl.		
18 Feb.	1885.	D. P. Booysen, Green-grape	1·101 ...	20·3
,,	,,	Jacob Retief, White Muscadel ...	1·116 ...	23·0
,,	,,	D. le Roux, Frontignac	1·110 ...	21·9
,,	,,	,, Pontac	1·107 ...	21·4
19 ,,	,,	G. H. Enslin, Pontac	1·107 ...	21·4
,,	,,	A. G. van Spuy, Pontac	1·107 ...	21·4
,,	,,	J. H. L. Minnaar, Green-grape ...	1·108 ...	21·6
,,	,,	Abrah. Marais, Pontac (half raisin) ...	1·118 ...	23·4
,,	,,	M. J. Basson, Green-grape	1·097 ...	19·6
25 ,,	,,	F. J. Louw, Pontac	1·111 ...	22·1
		Stellenbosch.		
28 Feb.	1885.	Welmoed (farm) Stein grape	1·104 ...	20·8
,,	,,	,, ,, Green grape ...	1·091 ...	18·4
11 Mar.	1885.	,, ,, Red green grape ...	1·109 ...	21·8
5 ,,	,,	W. A. Kriege, Stein grape	1·106 ...	21·2
,,	,,	,, White green grape ...	1·095 ...	19·2
,,	,,	,, Red green grape ...	1·095 ...	19·2
,,	,,	G. D. Kriege, jun., Red green grape...	1·096 ...	19·4
12 ,,	,,	W. A. Joubert, Stein grape	1·105 ...	21·0
,,	,,	,, Stein grape	1·118 ...	23·4
,,	,,	G. P. Louw, Stein grape	1·122 ...	24·1
		Jonker's Hock.		
21 Mar.	1885.	A. P. Watermeyer, Red green grape...	1·103 ...	20·7
,,	,,	,, Hermitage ...	1·0885 ...	17·95
		Hex River East.		
28 Mar.	1885.	W. de Vos Meiring, Red green grape, ¼ white green grape	1·115 ...	22·8

I found the temperature during fermentation varying between 70° and 94° F. The temperature of 70° to 75° F. is the best; that of 80° to 94° F. is much too high. The best way of keeping the temperature low is to admit only cold air into the store; it ought to be opened during the night and closed in daytime. The pressing cannot then, of course, be done in the store; this should be done in an outbuilding attached to the store and connected with it by a door. This is of great importance. The temperature of the fermenting liquid is naturally high, and the farmer is bound to do something in order to keep the temperature in the store as low as possible during the time of fermentation. The quality of the wine and the bouquet is principally dependent upon the temperature at which the fermentation takes place. By far the greater part of the Cape wines could be really exquisite wines if the pressing of the grapes and the temperature during fermentation were properly attended to. The cutting and collecting of grapes is done without sufficient care and attention. The workmen are more or less left to themselves. They do not take much interest in the work, all they care for is to have the baskets filled when the cart returns to fetch a fresh load. They don't think it worth their while to see whether any grapes are left, and a good quantity of grapes remains on the sticks. The berries which fall off in consequence of bad cutting and of tearing off the bunches, remain on the ground. At least 10 o/o of the ripe grapes thus remain in the vineyard, this is the share of the workmen. Also the "Nadruiven" remain in the vineyard, which could be collected and made into wine for the labourers. The grapes are collected in baskets; small tubs should be used instead, because many of the ripe grapes burst and a good deal of juice is lost. Baskets should only be used for grapes with hard skin, such as Haanepot. It is also a great mistake to allow leaves to get between the grapes; the green leaves deteriorate the quality and impart a bad flavour to the wine. Much valuable material is wasted in almost all the vineyards during the cutting and collecting of the grapes.

The pressing of the grapes is done according to the same method which was practised in Europe in former times. The method was introduced into the Colony with the vine itself, and has been used here for 200 years, that is to say, the method of wine making is still in the same stage that it was 200 years ago. Is this old method of pressing still carried out in Europe? In those parts of Europe where the best wine is made we do not find it, and where it is still in use it is done with much more cleanliness. It was abandoned because a better quality of wine was obtained by means of the new method. If the Cape farmers wish to dispose of their surplus stock in Europe, they will have to adopt the modern approved method of pressing.

The pressing is now performed in the following way:—The grapes are thrown into a large open circular vessel of four to five feet high with a perforated bottom; this stands in a large but shallow vessel, which serves as the receiver of the juice, from which it runs into a third vessel. A number of half-naked coloured men, in a state of active perspiration, are tramping the grapes in the first tub, thus the feet break the grapes, and by the elasticity of the sole, the seeds, &c., remain unbroken. Only the juice runs off, and if this were passed through a sieve only the pure grape juice would be obtained. But during the tramping some other substances are added to the juice. From the floor of the wine stores which are saturated with acetous germs, the trampers carry on their feet a large amount of detrimental substance into the juice, and also the sweat of the men goes into the juice; although this latter does not perceptibly increase the quantity it certainly imparts a most objectionable bouquet to the wine.

Some wine farmers use also the American Grape mills. This process is cleaner, but as those grape mills also break some of the seeds and stalks, the quality of the must is not improved by their use. The European grape mills are of such a construction as to avoid the breaking of the seeds and stalks

and are to be recommended to the wine farmers. But the greatest mistakes are made in the fermentation. Juice, husks and stalks are thrown together into the fermenting tubs, and the astringent harsh tannin is thus extracted from the husks and stalks, imparting to the wine that unpleasant scratching taste. And besides the fermenting tubs are open, and the juice can absorb from the air any quantity of those germs, which are later on a standing danger to the quality of the wine. All the bouquet compounds can freely escape during fermentation from the open vessels. These bouquet compounds, which are so characteristic of the Cape grape, would also be in the wine, if the making of the wine were better. In order to keep the fermenting tubs clean and sound during the time that they are not used, they ought to be whitewashed, and before the juice is filled into them again the next season, the lime must be carefully removed. It is a gross mistake to paint the tubs with lime before the juice is put in, or to put lime on the fermenting juice; this spoils the wine, and gives it that flat, insipid taste of acetate of lime. All the drawbacks connected with the open fermentation are not known with the closed fermentation. The temperature of the fermenting juice is much too high. It can be somewhat reduced by keeping the store closed during the day and open in the night.

The must only remains in the fermenting tubs during the first fermentation. After some days it is drawn over into casks, where the after fermentation sets in. As these casks are not always of the required degree of cleanliness, the wine which already contains acetous germs, has the best chance of turning bad the first year.

Wine prepared in this way cannot be considered as properly fermented grape juice. It also contains the juice of stalks and husks, which were extracted during fermentation; these additions give the wine the stalky taste.

The preparation of sweet wines.

Most sweet wines are made at the Paarl and at Constantia, but by different methods. Red Muscadel, White Muscadel, Hanepot and Pontac are chiefly used for this; the drying of the grapes takes place either on the sticks, or is done by spreading the cut grapes in the sun; only the Hanepot grape requires another treatment, as its skin is rather hard. Before it is dried it is put in baskets and immersed in boiling lye, then in water, which takes most of the lye off. This way of drying has some disadvantages. It is not performed with sufficient cleanliness. The lye, as well as the sun's heat, take away the bouquet. By lying so long is produced the specific raisin taste. Whenever raisins are to be used for making wine, those are preferable which have the purest taste. To obtain these, proper drying machines ought to be employed. The method employed at Constantia yields a much better product. The grapes are left on the vines, only the leaves are partially removed to admit the air and sun's heat; the fine bouquet of these raisins recommends this way.

The pressing of the raisins is done in the same untidy style; it only requires more time and a larger amount of objectionable materials is worked into the juice. During the tramping operations, fresh must is added to it, and a thick mask of appearance is obtained. To induce fermentation, fresh must is added again. In consequence of this enormous amount of sugar, the fermentation is incomplete, the greater proportion of the sugar remaining unfermented. Wine made in this way is of a peculiar character, it is extract, and it is used for mixing with inferior wines. About four times the amount of grapes is required for one leaguer of sweet wine as is required for dry wine. The price is therefore higher, and more so, because the working expenses are greater. If wine of this character (extract) were made in a more rational and clean way, by using machinery, it would fetch a

good price in Europe, as the duty on it is less than on the strongly alcoholized wines.

The husks are generally used for distilling brandy. Only the wine that freely comes off the husks is used; the husks are not pressed. Much wine remains thus in the husks, and is distilled with them, and the brandy could be of good quality, if only the distillation were done in the proper way. The husks of dark wine ought to be pressed rather than distilled with all the wine in them.

The making of brandy is of greater importance in those districts where little wine is made. It is made here in the following way: the grape juice with all the husks is left in the tubs until the first fermentation is over; husks and must are carried into the still and submitted to distillation. As the grape juice has only passed through the first fermentation a very considerable amount of sugar remains unfermented and is completely lost. The farmers are compelled however to proceed in this way, because there is such a complete want of the necessary amount of fustage, tubs, &c. As they can only proceed with cutting grapes after the tubs are empty, it is evident that a very large amount of the yield of the vineyards is wasted. It is certainly not the way to derive the greatest possible benefit from the vineyard. Wine which is intended for making good brandy should pass through the following stages: —The grapes are cut, cleanly pressed, and the must fermented in closed vessels. After the first fermentation the wine is frequently racked, and all particles of yeast which remain for a long time in suspension should be removed by filtration. By this treatment the bouquet of the wine is developed to perfection and the wine is ready for distillation; the bouquet of the wine passes into the brandy and renders it valuable, exportable and marketable everywhere in Europe.

If, however, wine with much sugar and yeast is put into the still, it is evident that volatile substances are formed and pass over into the brandy and makes it a tedious liquid.

Brandy is also made of wine which cannot be sold because it is of inferior quality or simply spoilt. Such brandy takes all the bad qualities from the wine. Some manipulations are in practice to purify the brandy, but the natural bouquet cannot be restored, because the wine was manipulated in an unnatural manner.

Raisins.

Raisins are also made at the Cape, and there used as such; that is to say, they are not used for wine making. There are two kinds of grapes used for making raisins, the Haanepot and the Currant grape, which yield very different products. The Haanepot raisins are large and thick-skinned, the latter, small thin-skinned currants, but the value of the latter is three times that of the Hanepot raisins. As the Currant grape bears more and can be more easily dried, its cultivation is much to be recommended; it would be a good export article. The Haanepot is dried in the same way as has been described in the preparation of sweet wines. But the unsatisfactory way of preparing the raisins shows itself here, more than in the preparation of sweet wines. I should recommend only artificial drying, using the large drying apparatus, which is employed in the southern European countries for drying fruit. By means of this apparatus it is easy to get light coloured raisins, and they are specially valuable for making sweet wines. The French wine manufacturers only use fresh raisins, and only those which have the least raisin taste.

Some varieties of grapes are certainly an excellent material of which to make raisins; if they are made in good quality they will have a reliable market in Europe. But if good wine be made, it will pay better than raisins.

Export of Grapes.

Fresh grapes, which have to stand a long journey before they reach their destination, must possess certain qualities. They must belong to that class of grapes which is called "grapes for eating." They must be fleshy, hard, and the skin tough, and they must not be readily putrifiable. All these properties are to be found in the White Hanepot grape. The second point of importance in the export of grapes is the packing. In an experiment which has been made this year, in sending fresh grapes to England, which arrived there in perfect condition, the packing was the following: properly selected bunches were carefully examined, to remove all berries which were not perfect or were damaged, and also those which made the bunch too compact. The point of the stalk, which was cut, was sealed with wax. This prevents the drying and shrinking of the grapes. The bunches were then wrapped in soft paper (tracing paper), to prevent their being soiled by the packing materials. In the one box charcoal was used for packing and in the other cork dust. The bunches were put in layers in the boxes and these separated by layers of cork dust or charcoal. The place in which they are kept on the voyage should not be too hot nor too cold. The most suitable temperature is 35° to 45° F. As the Cape grapes could reach the European market just at the time when the price of grapes is highest, all expenses would be paid and a handsome profit left.

BARON CARL VON BABO.

III. PROPOSALS AND RECOMMENDATIONS WITH REGARD TO THE IMPROVEMENT OF THE WINE INDUSTRY OF THE COLONY.

The first experiments made with a view to the introduction of the vine into South Africa have been successful. The conditions required for the growth and development of the same are very favourable. In course of time this branch of agriculture spread all over the Western Province. Even under the most primitive and simple treatment, the vine yielded most beautiful crops. Although the wine, which was produced here, was made contrary to the best principles, it always found a ready market in the Colony. The better wines could even be exported to Europe. In course of time, Viticulture became the most important branch of agriculture.

It appears, however, that the consumption of the wine did not keep pace with the extension of the viticulture and the increased production of wine. As a large proportion of the wine produced was inferior, much wine remained unsold; and it did not always pay to manufacture the wine into brandy, because the price of brandy was often very low. The surplus wine, which cannot be sold here, ought to be exported; but with this we have arrived at a point which presents very great difficulties. There are rich and populated countries, which could easily absorb all our surplus production of wine, but the attempts made to introduce our wines to these markets have not been successful. Many attempts are even now made with a view to exporting our wines, but they have been unsuccessful, because those who tried these experiments did not set to work correctly.

In order to give a correct idea as to the share which the Cape has at present in the wine trade of Great Britain, I quote the following figures, taken from the *Wein-Merkur* of February, 1885. The imports were in 1884:—

Dark Wines	...	8,817,166 gals.
Light Wines	...	6,321,479 ,,
		15,138,645 ,,

Most of this wine was from European countries. The Cape Colony only exported 64,584 gallons (about 500 leaguers) of this quantity. In 1883 it was only 49,872 gallons.

The value of wine imported into France last year was 339,679,525 francs. If better wine were made at the Cape, the Colony would certainly participate in this export of wine. And in order to enable the Colony to produce marketable wine, everything should be done and no means left untried, even if they should cause some expense. It is the wine-farmer who has to suffer most from the want of a reliable market. They are at present in a most critical condition. Some years ago the wine-farmers worked with very great profit, because the prices of wine were high. Gradually the prices of wine went down and many farmers were half ruined. But this state of depression in viticulture did not come on suddenly, its consequences could have been avoided. But the necessity of assisting and supporting the wine-farmer was not recognised in time, and the present state of the condition of viticulture, wine export and wine trade, is the consequence of the indifference shown with regard to this all-important branch of agriculture.

It is true that grapes could also be changed into a marketable article by concentrating the grape juice, by evaporation, into a thick treacle-like liquid, or by making them into brandy or raisins. But for the evaporation of the grape juice an apparatus is required, which is very expensive, and whose working requires great skill and knowledge. To make good raisins depends upon the quality of the grapes, as well as upon the manner in which they are made. To make raisins for export the old methods must be abandoned. To make good brandy, it is first necessary to make good wine. But it is obvious that if good wine were made, it would be more lucrative to sell the wine than to make brandy.

If wine is to be exported, the exporter has first to ascertain what quality of wine is wanted in the country to which it is to be sent. It is necessary to compare those wines with the wines which are intended for export. It is useless to send strong wines into countries where only light wines are drunk. If the exporter is at all capable of correctly ascertaining the difference between his own wine, and those in use in the country, to which he wants to send his wines, the first step in the right direction is taken. The next step, which requires a practical as well as a theoretical knowledge of wine-making, is to ascertain in what way the different kinds of grapes, and the different methods of manipulation, influence the quality of the wine, in order to find out how the wine for export is to be manipulated. It cannot be expected that the wine-farmer should undertake investigations of this kind. He does not possess the means of trying experiments, nor has he time for turning all his attention to a work from which he may obtain practical results only after years of hard work.

It is an undeniable fact, that neither farmer nor exporter know how wine, fit for export, is to be made, and it is necessary to teach the farmers by ocular demonstration. The instruction has to commence with the farmer, in order that he may be able at the next vintage to make a wine according to better principles, which is fit for export. As soon as the farmer has thus been convinced of the value of instruction, he will insist upon his sons also acquiring this knowledge, and then it is time to start with agricultural schools. What is wanted now is a place where the present generation of farmers can be instructed by ocular demonstration in the improved methods of wine-growing and manipulation.

Questions of much vital importance to the welfare of the whole Colony cannot be left to the farmers; we find that in all European viticultural countries, much is done by the several governments for improving the state of viticulture, by establishing experimental farms for the benefit of the farmers. It is a fact that the best wines are made, and have been made, since the results of the labours and experiments of these model and experimental wine-

farms have been generally adopted by the wine-growing section of the community. If in France the Government had not taken up and promoted the experiments and investigations with regard to the best means of retarding the spread of the Phylloxera, the viticulture of that country would have been completely ruined by this time. But as important as the Phylloxera question is for the European countries, so important is the question of the improvement of the wine industry for the Cape: no means should be spared in order to find out how exportable wine could be made at the Cape. It is admitted by all that the European methods for improving the wine industry must be the guide for the South African wine-growers, who wish to find a way by which to arrive at a correct method of making exportable wine. We must therefore first ask, what means have been adopted in Europe to improve the wine-industry there? It must be mentioned, however, that the methods of making wine were not at quite as low a standard as they are at the Cape, before the experimental wine farms were established. Notwithstanding it was found necessary to establish such model and experimental farms.

As the climatic conditions in those European countries are not as favourable as they are in South Africa, wine-growing there means something more than merely planting a cutting and letting it grow. The growth of the vine under different conditions had to be studied, and the means of checking the effects of insects and fungus had to be found out. The unfavourable climatic conditions which keep the wine farmer in a permanent state of anxiety, render it very difficult to follow these viticultural pursuits. But all these circumstances compelled the people to experiment, to observe, to study and to learn. We can profit from these labours, and the results of these experiments, and many of them we may apply without modification. The work already done in Europe will serve us a basis of operation. But if we wish to adopt the methods of cultivation which are in use in Europe, we must also adopt the means by which they arrived at these methods. How did they proceed? A number of model farms are established; the work done at these farms was to instruct the young farmers, and to try experiments as to better methods of growing the wine, and of manipulating wine, in order to reduce the expense and to improve the quality of the wine. As the farmers themselves took an interest in these model farms, asking for instruction, and being present at the work in vineyard and wine store, and as many new questions arose, which required attention, investigation and study, the number of these model farms connected with schools increased, and some of the first-established model farms developed into very large institutions.

The subjects of instruction at the Viticultural Academy in Austria, established 25 years ago as a model wine farm, are

Viticulture, comprising the study of the different varieties of grape, cultivation of vineyards, and manipulation of wine.
Chemistry of the vine and its products.
Anatomy and Physiology of the Vine.
Anatomy and Physiology of the Ferments.
National Economy.
Agricultural Law.
Klimatology.
Pedology.
Practical work in the Laboratory, Microscopical investigations, work in vineyard and wine store.

It is needless to deal with the influence which this institution has exerted upon the wine industry of Austria and Hungary, it is well-known all over Europe.

As the wine farmers in the Colony are in a most critical position, and as the present depression in the wine industry may only end in the complete ruin of the wine districts, which the wine farmers are not strong enough to

prevent, the establishment of a model wine farm should not be longer postponed, where for the present the wine farmers may get all that information, administered to them by ocular demonstration, which they must make use of in order to make exportable wine.

But in establishing a model wine farm the immediate wants and defects of this industry must be taken into account. For the present it is not required to have a school supplying theoretical instruction, in connection with the model farm, they would not meet the want of the Colony, viz., to supply immediate help to the suffering wine farmer. The immediate requirements are to prepare wine fit for export, to appoint days on which farmers may come to the farm, when certain manipulations and operations are gone through, and to see for themselves how these manipulations must be done and why they are performed.

The plan on which the work on this model farm is done should principally refer to the following items :—

1. The preparation of good wine on correct and recognized principles. This would prove the superior quality of the Cape grape, as well as of the wine made from it, for which Europe would always be a reliable market.

2. The model farm should supply wine farmers with all the information which the farmer who is anxious to learn requires. There he can get advice on all questions which are to him of special interest. An opportunity is here given to all wine farmers of being present on the farm, when important manipulations are carried on ; whenever these are performed notice may be given in the local papers, so that as many as possible may take part in this instruction. The success of this method in other countries proves that this is the surest way of disseminating in the shortest time a practical and correct method of making wine which will find a market in Europe.

It would be desirable that the exporters of wine (the wine merchants) also take part in these instructions.

When the model farm is completely established, courses of instruction can be arranged at certain times of the year, for the younger generation, to teach them all manipulation and all the work in the vineyard, and in the store, *how* it is to be done and why it is to be done in this and in no other way. This is of the greatest consequence for the future. How can a person be manager of a wine farm if he does not know all manipulations better, or at least as well, as his labourers.

3. The experimental part of the work on the model farm would refer to—

1. The cultivation of the vine.
2. The manipulation of wine.

1. (*a*) The different systems of growing, pruning and training the vine for the different varieties of grapes and soils.
   (*b*) Yield of different varieties under different treatment and on different soils.
   (*c*) What soils, as they occur in the Colony, are most suitable for the vine.
   (*d*) Sites. To what elevation can the cultivation of the vine be extended, and how is it affected, at different elevations by fungus, &c. Manures.
   (*e*) Grafting of our grapes on cuttings from American seedlings. This is a necessary precautionary measure, in order to meet certain emergencies.
2. (*a*) What stores are most suitable in this climate ? By what manipulation we obtain in this climate, in the shortest possible time, expotable wine.
   (*b*) Chemical investigation of wine in different stages, of grapes, soils and manures.

At the same time other scientific investigations on the abovementioned, and similar questions, are undertaken, which extend over some years and of which the practical results can be made use of at once. Such vino-chemical and physiological investigations have already produced results which are of the greatest value for practical wine making. From this it may be gathered that much work is to be done at the model farm. As it will require much work to supply information with regard to the most important wants (2 *a*) the establishment of this model farm should not be delayed.

By travelling about and visiting the farmers, it is impossible to do even in 10 years, the work which may be done on a model farm in 1 year. The establishment of a model wine farm will require some expenditure of money, which however will amply repay interest, when the wine-farmers are in a better position, and the greater part of the wine produced here is exported to Europe and elsewhere. This expenditure is a safe investment, but will not extend over 2 or 3 years, when the farm will support itself. The expenditure will only be the establishment of the model farm.

The next question is, where is the most suitable place for a model farm? It is only human and natural that the wine-farmers should consider their own districts as the most suitable, and it is therefore better not to rely entirely upon the opinion of the wine-farmers. The pecuniary question is of importance. The farm, which must be bought, should be near the railway, and should have different soils, permanent water, and should not be too small, because the expenses for building, &c., are more or less the same whether the farm be large or small, but they can be better defrayed from the yield of a large farm.

Suppose such a farm be found—then the proprietors would ask an exorbitant price, and as much must be altered on the farm, a vast expenditure would be incurred. To avoid all these inconvenient occurrences it would be best to make use of the splendid opportunity, which offers itself in the farm Tokay, being Government property. But let us ask whether Tokay will answer the purpose? I have been there several times, and have examined the place. It is an old place—and formerly only good places were selected for farms. There are different kinds of soils, specially the decomposed granite, which is the typical vineyard soil of the Cape, Stellenbosch, Paarl, Malmesbury, and Wellington Districts, the site is good. There is permanent water. It is near the railway, a splendid road leads to the station. A large area of soil can there still be brought under cultivation, and the visiting farmers can get much valuable information about the best methods of planting vineyards. The only objection that can be raised to Tokay, is that it is not in the centre of the largest wine districts. At present the Paarl is the largest wine district, but how long will this be, as soon as good exportable wine is made? Worcester and Robertson will be the largest wine districts and will require their own model farm. And by a reduction of the railway fare for wine farmers, visiting Tokay, the greatest objection is removed. There is at present, and under the present depressed condition of the country, no better place than Tokay for a model farm. If Tokay be selected the following expenses will have to be incurred:—

A. For Buildings.

1. Dwelling House for Director and Assistant.

2. Outbuildings for overseer and labourers.

3. Store and cellar: 1. For pressing. 2. For fermentation. 3. For manipulation and storing.

4. Tools and implements—fustage.

B. Current Expenses.

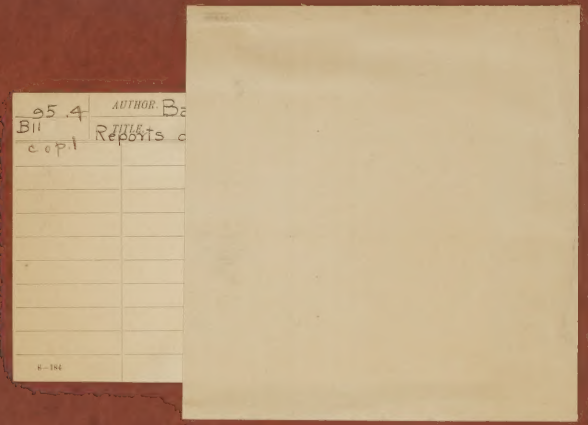
1. Salaries for director, assistant, overseers in vineyards, and labourers.

2. Petty expenses.

The returns of the farm cannot at present be even approximately stated, because the price of wine is fluctuating, and the number of vines under cultivation is not fixed. But suppose there are 100,000 vines, producing 3 leaguers per thousand (this is the case at High Constantia), and this sold in bottles at £15 per leaguer, it would yield £4,500.

BARON CARL VON BABO.

Cape Town, May, 1885.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